

**EXECUTIVE SUMMARY OF TESTIMONY OF
PHILLIP G. HARRIS, PRESIDENT & CEO, PJM INTERCONNECTION**

In his testimony before the House Energy and Commerce Committee, Mr. Phillip G. Harris, President and CEO of PJM Interconnection detailed a “road map” for Congressional action to strengthen the interconnected transmission grid and to meet customer needs for reliable service and stable prices. Mr. Harris outlined this road map in the context of the outage events of August 14, 2003.

Mr. Harris points out that the events of August 14, 2003 represent as much a crisis in confidence in the industry as it does a failure of the electric power grid. He notes that the outage of that day, although requiring critical study and analysis, must not paralyze the industry from moving forward with critical reforms. “We must learn from the positive experiences as well as the negative ones facing this industry and craft rational common sense rules that follow and respect the laws of physics which govern this speed of light product” Mr. Harris stated. His testimony details the value of regional coordination and notes that we cannot continue using outdated solutions to meet the 21st century needs of customers. He details a road map for Congressional legislation which includes the following points:

1. Provide FERC with the authority it needs to ensure that regional organizations can flourish to plan and manage the grid in a coordinated manner;
2. Do not discourage or strip FERC’s authority to move forward in those regions of the country that wish to move forward with the development of competitive markets;
3. Ensure that the laudable goal of protecting native load does not work to repeal the anti-discriminatory provisions of the Federal Power Act or to otherwise balkanize the grid. A clear statement from Congress that native load should be protected but flexibility in how that native load is protected would ensure this proper balance;
4. Whether federal or state siting is preferred, encourage regional planning processes, undertaken by independent RTOs with state and stakeholder input, before the power of eminent domain is exercised to appropriate private property to build transmission.

Mr. Harris points out that much of the PJM system was spared from the effects of the August 14 outage as a result of protective hardware, on PJM and neighboring systems, acting as it was designed to protect equipment and isolate the disturbance. The operation of these protective

relays had the effect of separating much of the PJM system from the surrounding grid and thus avoiding much of the blackout's impacts except in Northern New Jersey and in the Erie, PA. area. Thereafter, PJM system operators worked to rebalance the system and begin the process of restoration both on the PJM system and by providing assistance to neighboring systems in Ohio and New York.

5. Reliability standards should be made mandatory, with their development and enforcement overseen by a public body. Deference should be provided to regional solutions that improve reliability for the region and for neighboring systems.

Finally, although much of the protection of the PJM system occurred automatically, Mr. Harris explains that PJM's independent regional planning process has been a critical element to designing a system which can both support an interconnected grid but also withstand an outage of this magnitude. Mr. Harris notes that at the urging of the states at the time of PJM formation, PJM put in place a regional planning protocol prior to its initiating markets. In order to bring reliability in the Midwest region to a higher level, he details the work that is underway collaboratively by PJM and the Midwest ISO to develop a Joint Operating Agreement and reliability plan that will be effective, if approved, upon the integration of the Commonwealth Edison system into PJM. Finally, Mr. Harris urges Congress to encourage the development of such independent planning protocols and link them to any incentives it provides for the construction of transmission in order to ensure that transmission construction and the use of the power of eminent domain is undertaken wisely and judiciously.

TESTIMONY OF PHILLIP G. HARRIS

PRESIDENT & CEO
PJM INTERCONNECTION, L.L.C.

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON ENERGY AND COMMERCE

September 4, 2003

Testimony of Phillip G. Harris

Mr. Chairman and Members of the Committee:

The events of August 14, 2003 represent as much a crisis in confidence in this industry as it does a failure of the electric power grid. As one who has worked in this industry my whole life, I am vitally concerned that we restore the public's confidence by establishing a clear road map to move this industry forward. Of course, time needs to be taken to ensure careful analysis and the development of solutions which can be tested and retested prior to full scale implementation. And although thoughtful reflection is needed, we simply cannot allow the events of August 14 (as significant as they were) to paralyze us from moving forward.

None of us can repeal the laws of physics which ultimately control the behavior of this speed-of-light product. As a result, policymakers need to drive rational public policy, market development and infrastructure investment which free this industry from mountains of red tape, constant political and legal battles over individual proposals and never-ending regulatory proceedings over Regional Transmission Organization ("RTO") formation. These solutions also need to meet the interstate and international nature of this speed of light product. As a result, although I will spend part of my testimony addressing the specific questions you raised concerning the August 14 event, I want to lead with what I think is the far more pressing issue: How do we address the critical crossroads we find ourselves in today? How does Congress, as our nation's policymaker, moves this industry forward through clear and coherent policies and institutions? How do we avoid the pitfall of unclear or internally contradictory policies slowing industry growth and discouraging need investment?

To answer these questions, we can look at real facts and analyze the positive as well as negative experiences faced by this industry. The “bottom line” is that certain models of deregulation and restructuring of the industry have worked and have developed real value for the customer. It has been proven that restructuring and deregulation can work to provide real benefit to customers in the form of stable prices, increased generator efficiency and new demand side options for consumers. Although not necessarily the answer to the events of August 14, market rules and procedures can work to limit the adverse impacts of transmission or generation outages triggering larger events. And as a result of our transparent and independent regional planning process, the PJM system was designed to withstand and did withstand, for the most part, an outage of this magnitude. So as we move the industry forward, we must not throw out the baby with the bathwater or tie the hands of the regulator to move forward based on the positive experiences that have occurred during this otherwise troubled time.

Much of the mid-Atlantic region’s ability in real time to withstand the disturbance of August 14 was the result, not of human intervention, but of hardware working as it should---hardware that was designed to protect each of our systems from outside faults, voltage drops and other system disturbances that threaten system stability. But in the longer run, a transparent planning process undertaken by an independent entity such as a regional transmission organization with a “big picture” look at the entire grid, can ensure that the appropriate hardware is in place and that reliability is maintained proactively and at prudent cost to the consumer. And important market tools such as ordering redispatch of generation between neighboring systems, something which PJM and the Midwest ISO have put forward as a reliability solution in the Midwest, and which PJM and the New

York ISO are piloting between their systems, can help alleviate the adverse impacts of curtailments of individual transactions. Only independent entities such as RTOs can undertake these solutions in a manner which will not be seen by the marketplace as favoring one provider over another or sacrificing one entity's "native load" at the expense of another's "native load".

Just as Abraham Lincoln stated that "a house divided cannot stand", neither can an industry continue to rely on unchanged 20th century institutions and tools to police the new 21st century world surrounding this speed of light product. Today we find ourselves teetering somewhere in between a traditional and restructured environment. This is a highly unsustainable state and cannot help to either improve reliability or attract needed capital for investment. Let me give an example.

The Energy Policy Act of 2003 provides for incentives for the construction of vitally needed new transmission. Such investment is extremely important and Congress should be applauded for taking this bold step. However, in the same breath, there is discussion of adding provisions which would limit or suspend FERC's ability, through rulemakings, to create the very institutions needed to independently and in an unbiased manner, plan the right location for this new investment. Absent a rational planning process undertaken by an independent entity such as an RTO, one that balances the need for generation, transmission and demand side solutions simultaneously, we risk building transmission in the wrong place and appropriating private property for investments that don't necessarily solve (and in some cases create new problems) for the regional grid. In short, if we are not careful, without the proper tools in place, we run the risk of creating tomorrow's stranded investment and simply throwing ratepayer money at the problem.

By contrast, regional planning processes undertaken in an unbiased public process, allows the marketplace to obtain the needed information to effectuate the wise choice between transmission, generation and demand side solutions to meet our reliability and economic needs. The states in the mid-Atlantic were extremely wise during PJM's formation---they insisted that before any markets are started that the RTO have in place a regional planning protocol. They correctly noted that as we are talking of using a power, which only the government can grant, to appropriate private property, we ought to ensure that we are exercising this powerful government authority both wisely and judiciously. An unbiased regional planning protocol can do just that.

For all these reasons, we recommend that Congress undertake the following steps:

- i. Provide FERC with the authority it needs to ensure that regional organizations can flourish to plan and manage the grid in a coordinated manner;
- ii. Do not discourage or strip FERC's authority to move forward in those regions of the country that wish to move forward with the development of competitive markets;
- iii. Ensure that the laudable goal of protecting native load does not work to repeal the anti-discriminatory provisions of the Federal Power Act or to otherwise balkanize the grid. A clear statement from Congress that native load should be protected but flexibility in how that native load is protected would ensure this proper balance;
- iv. Whether federal or state siting is preferred, encourage regional planning processes undertaken by independent RTOs with state and stakeholder

input before the power of eminent domain is exercised to appropriate private property to build transmission.

- v. Reliability standards should be made mandatory, with their development and enforcement overseen by a public body. Deference should be provided to regional solutions that improve reliability for the region and for neighboring systems.

With this overview in mind, I will proceed to address the questions in your correspondence of August 22:

- 1. What exactly were the specific factors and series of events leading up and contributing to the blackouts of August 14?**
- 2. At what time did your company first become aware that the system was experiencing unscheduled, unplanned or uncontrollable power flows or other abnormal conditions and what steps did you take to address the problem? Were there any indications of system instability prior to that time?**
- 3. Which systems operated as designed and which systems failed?**

Answer

As noted above, the location, character and proximate cause of the initial disruption in the transmission and supply of electricity is the subject of an ongoing NERC/DOE investigation and PJM defers to that investigation. As a result, PJM will limit its response to actions it took on its own system both prior to and during the August 14 outage.

As to its own system, PJM first became aware of a disturbance on the Eastern Interconnection at about 4:10 pm on August 14th. Prior to that time, August 14th could be characterized as a typical unexceptional summer day in the PJM control area, with a typical number of lines out of service, and relatively few scheduled or unscheduled outages. At noon on August 14th, NERC initiated a routine time frequency correction across the Eastern Interconnection in accordance with NERC operating policies, because the time frequency had exceeded its margin for error. PJM was properly following the NERC standard process, but it is mentioned in this context because it accounts for a frequency fluctuation in PJM data at the time the correction was implemented.

PJM became aware of significant impacts on its system from an external disturbance at approximately 4:10pm. At the time of the disturbance, PJM recordings of telemetered load and frequency revealed an initial loss of more load than generation on the PJM system. Subsequently system operators reduced generation output in order to bring the system back into balance. PJM experienced a loss of load of approximately 4,500 MW of its total load of approximately 61,200 MW at the time of the disturbance. About 4,100 MW of PJM's lost load manifested in northeastern New Jersey, while an additional 400 MW of load was lost in northwestern Pennsylvania near Erie.

The disturbances noted by PJM at approximately 4:10pm resulted in some individual units going off-line in PJM and in transmission lines opening. The cascading effect of the outage caused PJM to lose approximately seven percent of its load, but automatic relay devices deployed throughout PJM in accordance with our design and planning criteria isolated most of the PJM footprint from the power loss. Automatic relay devices effectively isolated most of PJM from Ohio and New York, which were subjected

to prolonged outages. By 4:12pm., most of the tripping of generating stations and transmission lines within PJM had subsided. Thereafter, PJM system operators worked to rebalance generation and load within the PJM system by reducing system frequency to a normal range. In addition, PJM system operators initiated procedures for more conservative operation of the system, to assure that system restoration could proceed more effectively. The disturbance itself played out over the course of mere seconds – with no real-time human intervention possible – but system operators played a vital role in system restoration.

In summary, the system worked as it was designed---through the automatic operation of relays PJM was able to isolate problems which effectively separated it from the outage and “kept the lights on” for the overwhelming majority of its customers. Through swift operator action, PJM was able to stabilize its system and also provide critical support to the restoration efforts in Northern New Jersey and Northwestern Pennsylvania, as well as the neighboring systems in the New York, and Ohio.

- 4. If events similar to those that occurred on August 14, 2003 had happened a year ago, would the results have been the same? If similar events occur a year from now, do you anticipate having to place equipment and processes sufficient to prevent a reoccurrence of the August 14 blackout?**

Answer

Prior to the August 14 outage, PJM and its Midwest counterpart, the Midwest ISO had just reached agreement on an historic Joint Operating Agreement and Reliability Plan that, if implemented, would bring a new level of coordination and data sharing that would

clearly have avoided some of the communication and coordination problems that arose in the context of the August 14 outage. The Joint Operating Agreement and Reliability Plan provides for an unprecedented level of coordination and data sharing among neighboring systems in the Midwest. The Joint Operating Agreement detailed monitoring measures and specific actions that each of the large RTOs would take to clear congestion or reliability problems on the other's system. at key designated flowgates. It would provide for actions that presently do not occur systematically in the Midwest including:

- ◆ day-ahead and real-time monitoring of each RTO's system;
- ◆ detailed data exchange between the two RTOs;
- ◆ emergency operations protocols;
- ◆ joint planning protocols; and
- ◆ mandatory redispatch of each other's generation in order to relieve congestion on the other's system.

This Agreement, coupled with the fact that there would be just two entities, both with planning responsibility and a large regional look as opposed to multiple control areas with a more limited view of neighboring systems, would provide for an increased level of reliability in the Midwest and would reduce the coordination and communication issues that exacerbated the problems which occurred on August 14th. The Joint Operating Agreement and associated reliability plan were undergoing stakeholder review at the time of the August 14th outage. Subsequent to that time, both PJM and the Midwest ISO have committed to reviewing the document in light of lessons learned from the August 14th outage and providing appropriate enhancements. PJM looks forward to review and comment by the respective stakeholders and state commissions in the area.

That being said, PJM believes that should the Joint Operating Agreement and Reliability plan be allowed to move forward it would provide a model that has been sorely lacking in this nation relative to coordination and communication between two large regional entities each charged with the responsibility of ensuring reliability of the regional transmission grid.

5. What lessons were learned as a result of the blackouts?

6. How can similar incidents in the future be prevented?

Answer

As the DOE investigation to the causes of the blackout is first beginning, it is too soon to detail with specificity all of the “lessons learned” from the August 14 event. That being said, there are some overarching lessons of August 14 which played out dramatically in how different entities reacted:

We cannot continue to use 20th century solutions to solve 21st century problems--- In the last century, reliability was ensured through a series of loosely described emergency support agreements among neighboring utilities. No regional planning process existed and each individual utility was charged with maintaining and planning for the reliability of its individual portion of the grid. Although regional reliability councils exist to coordinated regional efforts, such entities were neither independent of the market participants nor empowered to require solutions and order penalties. It is clear that these loose agreements and institutions of the last century will not work in the future. Rather, we need Congress to:

- i. encourage the development of regional transmission organizations and not strip or suspend FERC authority to undertake necessary generic rulemakings;
- ii. tie any transmission investments to the use of regional planning processes undertaken with the states and interested stakeholders to ensure that whatever transmission is incented is the “right” transmission located at the key location needed to ensure maximum benefit to reliability and economics of grid operation;
- iii. encourage and require native load protection but not tolerate discriminatory conduct favoring one’s own market position in the name of protecting one’s “native load”; and
- iv. finally, Congress should make reliability standards mandatory but avoid codifying statutory deference to standard-setting and enforcement in some regions but not others. Deference should be provided to regional solutions, arrived at in open stakeholder processes and with state concurrence, in all parts of the country while any national organization review is limited to ensuring that solutions arrived at on less than an interconnection-wide basis, promote reliability in the larger region. The negotiation of the Joint Operating Agreement and reliability plan between PJM and the Midwest ISO, which will soon be submitted for NERC review, is an example of the process working at its best with NERC focusing on whether the plan enhances reliability between regions while avoiding the commercial infighting among member companies.

For grid operators themselves, it is clear that we have to ensure that our relay hardware is appropriately sized, maintained and programmed to protect systems in the event of cascading outages. RTOs need to be more vigilant in defining their role vis-à-vis the local transmission owner who still owns and maintains this critical equipment. Agreements such as the MISO/PJM Joint Operating Agreement should be a mandatory “baseline” of coordination between RTOs and should provide appropriate and reciprocal support of adjacent systems both between market areas and where market areas abut non-market areas. And most of all, we need to move this industry forward with flexible policies that are designed to meet and restore the public’s confidence in this critical industry so important to our nation’s secure future.

I thank you for this opportunity to testify and look forward to your questions.



Phillip G. Harris

Phillip G. Harris, a 25-year energy industry veteran, is president and chief executive officer of PJM Interconnection.

PJM, the nation's first fully functioning regional transmission organization, administers the world's largest energy market and operates the nation's largest electricity grid. Mr. Harris is also chairman of the Board of Managers.

Mr. Harris has served as a member of the North American Electric Reliability Council's (NERC) Board of Trustees; serves on the Board of the mid-Atlantic Area Council (MAAC), one of 10 reliability councils within NERC - having served as the regional manager of MAAC; and is a member of the National Association of Corporate Directors, serving on the Corporate Advisory Committee. Mr. Harris frequently provides expert testimony on issues of restructuring the electric industry, having appeared before many federal and state commissions as well as congressional and state legislatures. He has authored articles about the electric competitive marketplace for various publications and is a national subject matter expert often called upon by media outlets including *The Wall St. Journal*, *CNN*, *C-SPAN*, *Forbes*, *Fortune* and *Time*. He was also a featured speaker at the National Press Club's Newsmaker Series.

Mr. Harris has forged partnerships with Electricité de France and Tokyo Electric Power Company (operators of the world's largest and second-largest power grids respectively) to further each company's preparedness to meet the world's rapidly increasing demands for reliable and affordable power.

A native of New Mexico, Mr. Harris is a graduate of the United States Military Academy at West Point, with a degree in Applied Science and Engineering. He earned his Master of Arts in Business Management - with an emphasis on research and statistical methodology - from the University of Northern Colorado. He is a Certified Management Accountant and a Computer Systems Professional.

PJM operates the world's largest competitive wholesale electricity market and North America's largest centrally dispatched control area. The company currently coordinates a pooled generating capacity of more than 76,000 megawatts and operates a wholesale electricity market with about 250 market buyers, sellers and traders of electricity. PJM, the country's first fully functioning regional transmission organization, has administered more than \$17 billion in energy and energy service trades since the regional markets opened in 1997. More than 70 nations have sent delegates to PJM to learn about its market model and the operation of the grid in a region including more than 25 million people in all or parts of Del., Md., N.J., Ohio, Pa., Va., W. Va. and the District of Columbia. Visit PJM at www.pjm.com.